NDV Server Frequently Asked Questions

This document contains a number of frequently asked questions concerning the Natural Development Server (NDV) under OS/390.

The following topics are covered:

- NDV server starts and terminates immediately
- Which dataset should I analyze to get error information?
- Trace output shows "Cannot load NATURAL Front End "
- Trace output shows "Transport initialization failed" "EDC8115I Address already in use"
- How do I get information about which process occupies a port number?
- The task that occupies a port number is not active but the port is still occupied. How do I drop the stuck connections?
- Trace output shows "Error at:Template runtime connect"
- NDV task abends with User Code 4093 and SYSOUT message CEE5101C
- Required LE/370 runtime options
- Useful LE/370 runtime options
- How do I pass LE/370 runtime options?
- Definitions required in Natural Security
- I do not get a NAT0954 even if I specify DU=OFF
- Map Environment fails with a NAT3048
- Map Environment fails with Stub RC nn
- Special characters are not translated correctly
- How do I find out which hexadecimal value must be specified for TABA1/TABA2?

NDV server starts and terminates immediately

At server initialization, the NDV server

- allocates central control blocks,
- opens the datasets STGTRACE, STGSTDO, STGSTDE, STGCONFG,
- obtains the configuration file,
- loads the Natural Front-End,
- initializes the first Natural session and
- launches the TCP/IP listener task

If one of these steps fails, the server cannot continue and terminates immediately.

Analyze the trace output (STGTRACE) or the error output (STGSTE) to find out the problem.

Which dataset should I analyze to get error information?

STGSTE	Contains only error output. Each record consists of 2-4 lines depending on whether it is a Natural error, a system error or an NDV stub error.
	Natural Error
	1. **DayOfMonth Time TaskId UserId**
	2. **TaskId NDV Error:** error classification
	3. **NATURAL FrontEnd error** or **NATURAL runtime error**
	4. Natural error text
	System Error
	1. **DayOfMonth Time TaskId UserId**
	2. **TaskId NDV Error:** error classification
	3. **TaskId Sys Error:** System error text
	NDV stub error
	1. **DayOfMonth Time TaskId UserId**
	2. **TaskId NDV Error:** error classification
STGTRACE	Contains NDV trace information and error information. Each trace record contains
	DayOfMonth Time TaskId Trace information text
	The string **PrintError** in the Trace information text prefixes errors.
STGSTO	Content of the configuration file allocated to STGCONFG.
SYSOUT	Messages from LE/370 runtime system.

Trace output shows "Cannot load NATURAL Front End "

The Natural Front-End specified by the NDV configuration parameter FRONTEND_NAME was not found in the load library concatenation.

Trace output shows "Transport initialization failed" "EDC8115I Address already in use"

The TCP/IP port number specified by the NDV configuration parameter PORT_NUMBER is already in use by another process.

How do I get information about which process occupies a port number?

TSO command **NETSTAT (PO 4712)** displays connections of Port 4712. The first column of the list refers to the task that owns the port.
Or enter the OS/390 Unix System Services command **netstat -P4712**.

The task that occupies a port number is not active but the port is still occupied. How do I drop the stuck connections?

Enter TSO command NETSTAT (PO *nnnn*) to list connections for port nnnn.

Output of the NETSTAT (PO 4712) command:

```
EZZ2350I MVS TCP/IP NETSTAT CS V2R8        TCPIP NAME: DAEFTCP2        06:45:19
EZZ2585I User Id  Conn    Local Socket           Foreign Socket        State
EZZ2586I -------  ----    ------------           -------------         -----
EZZ2587I SAGNDV31 000031CC 157.189.160.55..4712   192.168.40.11..3152   Establsh
EZZ2587I SAGNDV31 000005E9 0.0.0.0..4712          0.0.0.0..0            Listen
EZZ2587I SAGNDV31 000031CD 157.189.160.55..4712   192.168.40.27..4250   Establsh
EZZ2587I SAGNDV31 000031D5 157.189.160.55..4712   157.189.164.133..2906 Establsh
EZZ2587I SAGNDV31 000031D8 157.189.160.55..4712   157.189.164.152..1099 Establsh
```

User Id	The job that uses port 4712.
Conn	Connection ID.
Foreign Socket	Connected clients.
State	Connection status.

If State contains FinWait, you need not drop that connection, because connections of that status do not prevent an NDV server from using that port.

To drop the connection, enter the MVS command
`VARY TCPIP,DAEFTCP2,DROP,000005E9.`

Where DAEFTCP2 must match your TCP/IP job name (TCPIP NAME: DAEFTCP2) in the first line of the NETSTAT output) and 000005E9 is the connection ID in the column Conn.

Trace output shows "Error at:Template runtime connect"

When a Natural development server initializes, it starts a Natural session using the session parameter defined by the NDV configuration parameter SESSION_PARAMETER. The profile definition of the NDV configuration parameter DEFAULT_PROFILE is appended.
If the initialization of the template session fails, the server terminates immediately. The original error can be found below the message "Error at:Template runtime connect".

NDV task abends with User Code 4093 and SYSOUT Message CEE5101C

The account of the NDV server is not defined in OS/390 Unix System Services. If you start the NDV server as a started task, the member name of the started task must be defined under OS/390 Unix System Services. If you start the NDV server as a batch job, the user that submits the job must be defined under OS/390 Unix System Services.

Required LE/370 runtime options

LE/370 runtime options that must be specified to operate an NDV server.

POSIX(ON)	Enables the NDV server to access the POSIX functionality of OS/390. If you start a NDV server with POSIX(OFF), it terminates immediately with a user abend U4093 and the system message EDC5167. IBM supplies the default OFF.
TRAP(ON,NOSPIE)	Defines the abend handling of the LE/370 environment. ON enables the Language Environment condition handler. NOSPIE specifies that Language Environment will handle program interrupts and abends via an ESTAE, that is the Natural abend handler receives control to handle program interrupts and abends. If you do not specify TRAP(ON,NOSPIE) the Natural abend handling does not work properly. IBM supplies the default (ON,SPIE).
TERMTHDACT(UADUMP)	Defines the the level of information that is produced in case of an abend. The option UADUMP generates a Language Environment CEEDUMP and system dump of the user address space. The CEEDUMP does not contain the Natural relevant storage areas. IBM supplies the default (TRACE).

Useful LE/370 runtime option?

LE/370 runtime options to monitor and tune NDV servers.

RPTOPTS(ON)	Prints LE/370 runtime option settings to SYSOUT after server termination.
HEAPPOOLS	The HEAPPOOLS run-time option is used to control an optional heap storage management algorithm, known as heap pools. Refer also to Language Environment for OS/390 & VM Programming Reference. The setting of this parameter depends on NDV functionality mostly used by NDV clients. A good value to start with is: HEAPP=(ON,40,3,80,7,224,7,528,3,1344,8,2048,8).
ALL31(ON)	Specify ALL31(ON) if your entire Natural environment runs in 31-bit mode to prevent LE/370 switching addressing mode.
STACK(64K,16K,ANY,FREE)	Specify the ANY option if your entire Natural environment runs in 31-bit mode. This enables LE/370 to allocate the storage for the STACK segment above the 16 MB line. The STACK segment above 16 MB increases the number of subtasks you can create within the NDV region. The initial and extend size (64 KB and 16 KB in the example) should be determined for your own environment by using the LE/370 storage report generated when you specify RPTSTG(ON).
HEAP(800K,64K,ANY,FREE,,)	Initial heap storage (see STACK option).
ANYHEAP(1300K,200K,ANY,FREE)	Library heap storage (see STACK option).
RPTSTG(ON)	Generates, after server termination, a report of the storage the server used. At the end of the report, it suggests cell sizes for the HEAPPOOLS option. This option decreases performance of the server. Use it only as an aid to find best settings for HEAPPOOLS definition.
ENVAR(TZ=)	The ENVAR option enables you to set UNIX environment variables. The only environment variable applicable for the NDV server is TZ (time zone). **Example:** ENVAR(TZ=CET-1DST) CET - 1 hour daylight saving time

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How do I pass LE/370 runtime options?

1. With the PARM parameter specified in the EXEC card of the NDV startup job.
    The length of the options is limited by the maximum length of the PARM parameter.

    ```
    //NDV EXEC PGM=NATRDEVS,
    // PARM='RPTOPTS(ON)/server-id'
    ```

2. Assemble an LE/370 runtime option module CEEUOPT and link it to the NDV load module.

    ```
    //KSPLNDV  JOB  KSP,CLASS=K,MSGCLASS=X
    //*
    //* RELINK NDV SERVER WITH LE/370 RUNTIME OPTIONS
    //*
    //************************************************************
    //* STEP1: ASSEMBLE LE/370 RUNTIME OPTION MODULE
    //*
    //STEP1 EXEC PGM=ASMA90,PARM='DECK,NOOBJECT'
    ```

```
//SYSPRINT DD SYSOUT=*
//SYSUT1   DD UNIT=SYSDA,SPACE=(CYL,(1,1))
//SYSUT2   DD UNIT=SYSDA,SPACE=(CYL,(1,1))
//SYSUT3   DD UNIT=SYSDA,SPACE=(CYL,(1,1))
//SYSPUNCH DD DSN=&&TEMPOBJ(CEEUOPT),DISP=(,PASS),UNIT=SYSDA,
// SPACE=(TRK,(1,1,1)),DCB=(BLKSIZE=3120,LRECL=80,DSORG=PO)
//SYSLIB   DD DSN=CEE.SCEEMAC,DISP=SHR                    <<<<<<
//         DD DSN=SYS1.MACLIB,DISP=SHR                    <<<<<<
//SYSIN    DD *
CEEUOPT  CSECT
CEEUOPT  AMODE ANY
CEEUOPT  RMODE ANY
         CEEXOPT ENVAR=(TZ=CET-1DST),                          X
                 HEAPPOOLS=(ON,40,50,80,90,224,80,528,50,1344,90,2048,  X
                 90),                                           X
                 POSIX=(ON),                                    X
                 RPTOPTS=(ON)
         END
/*
//****************************************************************
//* STEP1: LINK RUNTIME OPTION MODULE
//*
//STEP2    EXEC  PGM=IEWL,
//         PARM='NCAL,RENT,LIST,XREF,LET,MAP,SIZE=(9999K,96K)'
//SYSPRINT DD  SYSOUT=*
//SYSUT1   DD  UNIT=SYSDA,SPACE=(TRK,(5,5))
//SYSLMOD  DD  DSN=&&CEEOBJ(CEEUOPT),DISP=(,PASS),UNIT=SYSDA,
// SPACE=(TRK,(1,1,1))
//SYSLIB   DD  DSN=&&TEMPOBJ,DISP=(OLD,PASS)
//SYSLIN   DD  *
 INCLUDE SYSLIB(CEEUOPT)
  ENTRY   CEEUOPT
   ORDER CEEUOPT
 NAME CEEUOPT(R)
/*
//****************************************************************
//* STEP3: RELINK NDV SERVER WITH RUNTIME OPTION MODULE
//*
//STEP3    EXEC PGM=IEWL,
//         PARM='RENT,XREF,LIST,LET,REUS,SIZE=(300K,64K),CASE=MIXED,
//              AMODE=31,RMODE=ANY'
//SYSUT1   DD  UNIT=(SYSDA),SPACE=(TRK,(10,4))
//SYSLMOD  DD  DISP=SHR,DSN=NATURAL.NDV.LOAD        <<<<<<
//SYSPRINT DD  SYSOUT=X
//NDVLOAD  DD  DISP=SHR,DSN=NATURAL.NDV.LOAD        <<<<<<
//CEELOAD  DD  DISP=SHR,DSN=&&CEEOBJ
//SYSLIN     DD *
 REPLACE CEEUOPT
 INCLUDE NDVLOAD(NATRDEVS)
 INCLUDE CEELOAD(CEEUOPT)
 NAME NATRDEVS(R)
/*
```

The lines marked with <<<<<< must be adapted to your environment.

Definitions required in Natural Security

- Each client must be defined in Natural Security if the Transition Period Logon flag in NSC is set to NO. Otherwise, your Map Environment fails with a NAT0873.
- Each user must have either a default library or a private library. Otherwise your Map Environment fails with a NAT1699.

- You must not specify a startup program that executes an I/O statement or stacks a LOGON, LOGOFF or RETURN command, because the program is executed whenever you change the focus to that library within the tree view.
- If you add a new user, you must specify a password for this user. Otherwise, the Map Environment fails with a NAT0838.

I do not get a NAT0954 even if I specify DU=OFF

The LE/370 runtime option TRAP must be set to TRAP(ON,NOSPIE).

Map Environment fails with a NAT3048

Specify session parameter ETID=' '. If you have Natural Security, clear the ETID definition for that user.

Map Environment fails with Stub RC nn

Stub return codes are raised by the NDV Front-End stub if it detects a logical processing error when dispatching the NDV request. The NDV trace output contains detailed information about the reason for the error.

The following Stub return codes are possible:

1	**Error during session reconnect** (for future use).
2	**Cannot create new session directory entry or subtask.** If the Natural Studio executes a Map Environment, the NDV server allocates an entry in its session directory and creates a new subtask. If one of these actions fails, the Stub RC 2 is raised. **Reason:** • Region size (virtual storage below 16 MB) for the NDV server is too small, • Number of subtasks exceeds the limit specified by the OS/390 Unix System Services parameter MAXTHREADS. **Action:** Increase region size or MAXTHREADS, or distribute the clients to several NDV server. To save memory below 16 MB, you can also specify the ANY option of the LE/370 parameter STACK (refer to Useful_LE_runtime options). The number of active tasks can be displayed using the OS/390 system command **D OMVS,PID=*process-id*** (where *process-id* is the process id of the NDV server). The value of MAXTHREADS can be displayed with **D OMVS,OPTIONS**.
3	**Cannot initialize new session.** This error occurs if a storage allocation for internal NDV control buffers fails due to a lack of virtual memory above 16 MB. **Reason:** Virtual memory above 16 MB too small. **Action:** Increase the virtual memory above 16 MB, decrease the number of physical storage threads, configure NDV to use the Natural roll server, or distribute the clients to several NDV servers.

4	**Session execution failed.** Internal error. The Natural Studio uses an invalid session identifier to process a request. **Reason:** • On Map Environment the session ID already exists. • The Natural session with specified ID is not initialized. **Action:** Locate the defective session ID in the server trace file and cancel it using the monitor, or restart your Natural Studio.
5	**I/O execution not allowed.** In some situations, a Natural IO is prohibited at the NDV server. **Reason:** • IO execution during LOGON request, • IO execution during execution of a transaction processor. **Action:** Locate the IO buffer in the server trace file to find out which IO should be processed. Check for any startup program specified for the library you want to logon.
6	Not applicable.
7	**Error during I/O execution.** The NDV server cannot finish a terminal IO. **Reason:** • Virtual memory above 16 MB too small, • IO reply buffer send by Natural Studio is invalid. **Action:** Increase the virtual memory above 16 MB. If the IO reply buffer is invalid, contact Software AG support.
8	**Protocol element missing.** Internal error, contact Software AG support.
9	**NDV not installed on Natural systemfile.** NDV server cannot execute the Natural module TRPRO located on library SYSLIB. **Reason:** The NDV modules are not loaded on the FNAT. **Action:** INPL the NDV modules.
10	**LOGON command required.** If you execute a program on the NDV server that executes a LOGOFF (or a RETURN when no SETUP record is available), the logon library is undefined. In an online environment the Natural Security logon screen is displayed in this situation. Under NDV the Natural session rejects all requests except a LOGON command. This applies only if Natural Security is installed. You can execute a LOGON command either by using the command line or by clicking on any library in your tree view.

Special characters are not translated correctly

The ASCII-EBCDIC translation for NDV uses the Natural translate tables TABA1/TABA2. These tables can be maintained at customer site. The translate tables can be modified as follows:

1. Modify source member NTTABA1/NTTABA2 on the Natural distribution library. Reassemble NATCONFG and relink the Natural nucleus.
2. Specify the Natural session parameter TABA1/TABA2.

How do I find out which hexadecimal value must be specified for TABA1/TABA2?

Run the following program on your Natural for Windows locally.

```
#A(A1) = '{'
   WRITE A(EM=H)
   END
```

Output is **7B**.

Run the program on a mainfram (edit the program with the Natural mainframe editor).
Output is **75**, assuming that you use a German EBCDIC table. If you use a US EBCDIC table, the output will be C0.

Start your NDV server session with TABA1=(75,7B) and TABA2=(7B,75).